

WAYS TO MODERNIZE THE METHODOLOGY OF TEACHING THE COURSE “HUMAN AND ANIMAL PHYSIOLOGY” IN HIGHER EDUCATION INSTITUTIONS

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ANNOTATION: This article analyzes the issues of modernizing the methodology of teaching the course “Human and Animal Physiology” in higher education institutions in accordance with contemporary educational requirements. The importance of interactive teaching methods, digital learning technologies, and pedagogical approaches aimed at developing students’ independent learning and practical activities is highlighted. The study also examines the use of innovative teaching methods in the educational process, the integration of theoretical knowledge with practical skills, and the methodological aspects of forming students’ professional competencies. The research findings indicate that the application of modern pedagogical technologies plays a significant role in increasing the effectiveness of teaching physiology.

KEY WORDS: physiology, higher education, interactive methods, innovative education, pedagogical technologies, teaching methodology, competence.

INTRODUCTION

At present, improving the quality of the educational process and adapting it to modern requirements is considered one of the key priorities in the higher education system. In particular, the introduction of innovative pedagogical technologies in teaching biological disciplines, the development of students’ independent thinking, and the formation of their professional competencies have become urgent tasks.

The course “Human and Animal Physiology” occupies an important place in biology, medical, and pedagogical fields of study. This subject focuses on studying physiological processes that ensure the vital functions of living organisms. Therefore, alongside theoretical knowledge, it is essential to effectively use practical classes, experiments, and scientific analysis methods in teaching physiology.

However, traditional teaching approaches often fail to ensure full student engagement. For this reason, it is necessary to increase the effectiveness of teaching physiology by modernizing the educational process through the introduction of interactive methods and contemporary pedagogical technologies.

The course “Human and Animal Physiology” scientifically examines the vital processes occurring in living organisms. Through this subject, students gain knowledge about the functioning of body systems, including the nervous system, blood circulation, respiration, digestion, and metabolism.

Studying physiology contributes to the development of biological thinking, scientific observation skills, the ability to analyze experimental results, and a deeper understanding of biological processes. Moreover, this discipline plays a significant role in the professional training of future teachers and specialists.

Effective teaching of physiology in higher education helps connect students’ theoretical knowledge with practical activities, which in turn increases their interest in scientific research.

Main Part. In the process of teaching physiology in higher education institutions, a number of methodological problems are often encountered. These include:

- the dominance of traditional teaching methods;
- insufficient development of students’ independent thinking skills;
- ineffective organization of practical training sessions;
- limited use of modern information technologies in the educational process.

To address these issues, it is essential to modernize the educational process and introduce new pedagogical approaches.

Today, interactive methods are widely used in education. Such methods ensure active student participation and contribute to the development of independent thinking.

In teaching physiology, the following interactive methods are considered effective: problem-based situations, the “How?” hierarchical diagram, case studies, clustering, the aquarium method, conceptual mapping, project-based learning, and others. These methods not only help strengthen students’ knowledge but also enhance their logical thinking skills.

The modernization of the methodology for teaching physiology can be implemented in the directions illustrated in Figure 1.

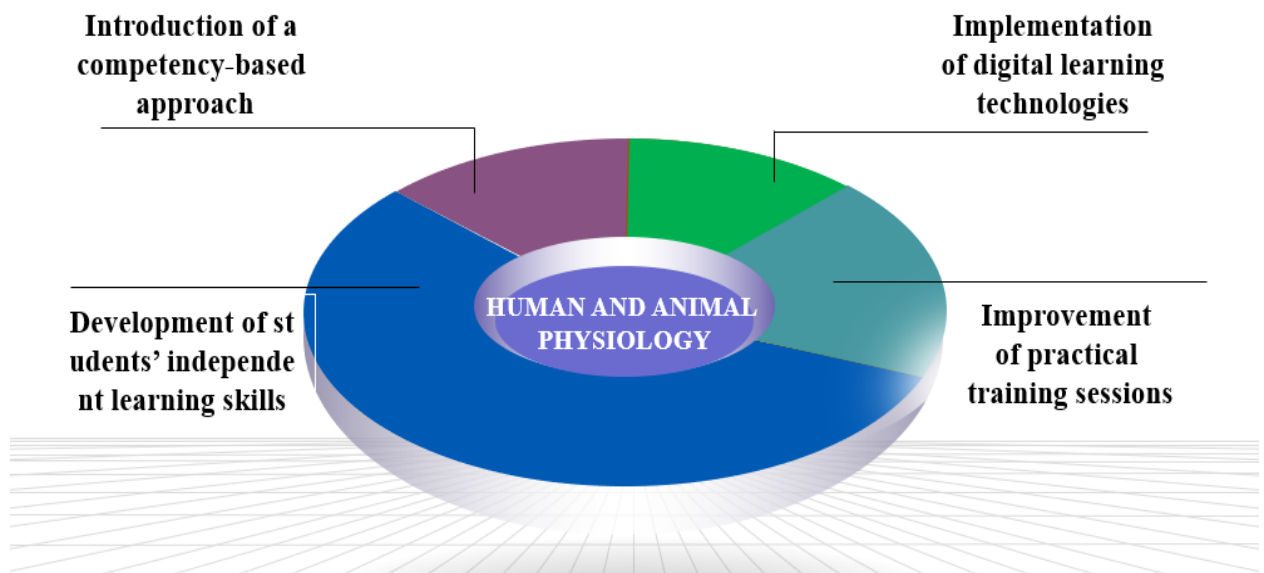


Figure 1. Main Directions for Modernizing the Methodology of Teaching the Subject

1. Introduction of Digital Learning Technologies.

In the modern education system, the use of digital technologies is considered one of the key factors in improving the effectiveness of the learning process. In particular, the application of digital learning technologies in teaching biological disciplines, including the course “Human and Animal Physiology,” helps students gain a deeper understanding of complex physiological processes. Digital tools make it possible to present theoretical knowledge in visual and interactive forms, which increases students’ interest in learning and promotes more effective knowledge acquisition.

One of the main components of digital learning technologies is electronic textbooks. E-textbooks allow students to study learning materials anytime and anywhere. Such resources include text, graphical images, animations, video materials, and interactive tasks, which contribute to a clearer understanding of the subject matter. In physiology, demonstrating complex processes in the human and animal body through animations or interactive diagrams helps students comprehend the content more deeply.

Virtual laboratories also play an important role in teaching physiology. In some cases, traditional laboratory classes cannot be fully implemented due to limited technical resources or insufficient conditions for conducting experiments. Virtual laboratories enable students to simulate various physiological experiments in a computer-based environment. This allows them to observe experimental procedures, analyze results, and develop skills in drawing scientific conclusions. Moreover, virtual laboratories are convenient from a safety perspective, as they provide opportunities to study complex or potentially hazardous experiments in a secure setting.

The use of multimedia tools is another significant aspect of modernizing the educational process. Multimedia technologies allow complex biological processes-such as cardiac function, transmission of nerve impulses, or the mechanism of respiration-to be demonstrated visually. Video lectures, animated models, and interactive presentations capture students’ attention and facilitate better understanding of the topics. In addition, the use of digital learning platforms contributes to enhancing educational effectiveness.

Through distance learning systems, students can be provided with supplementary learning materials, assessment tasks, and resources for independent study. This approach also supports continuous monitoring of students' knowledge and the development of their autonomous learning skills.

2. Improvement of Practical Training.

Practical training plays a significant role in teaching the course "Human and Animal Physiology." This discipline is not limited to theoretical knowledge; it also requires the study of various physiological processes through experiments and observations. Practical classes provide students with opportunities to directly observe complex physiological processes occurring in the body, analyze them, and draw scientific conclusions. Therefore, the effective organization of laboratory work and experimental activities is essential for strengthening students' theoretical knowledge.

One of the main directions for improving practical training is enriching the content of laboratory work and organizing it on the basis of modern teaching methods. For example, experiments such as studying cardiac activity, measuring blood pressure, identifying reflex processes, or analyzing the functioning of the respiratory system help students understand physiological mechanisms from a practical perspective. Through such experimental activities, students consolidate their knowledge and develop skills in scientific observation.

In addition, the use of methods that encourage active student participation is important for the effective organization of practical sessions. Approaches such as working in small groups, jointly analyzing experimental results, and discussing problem-based situations increase student engagement. These practices contribute to the development of collaborative learning environments and enhance students' logical thinking abilities.

The use of modern laboratory equipment is also crucial in improving practical training. Contemporary instruments enable accurate measurement and analysis of physiological processes, allowing students to become familiar with scientific research methods and apply them in practice. Furthermore, special attention should be paid to students' independent activities in laboratory settings. By planning experiments самостоятельно, recording results, and analyzing outcomes, students develop research skills that form a solid foundation for their future scientific and professional work.

3. Development of Students' Independent Learning.

The development of students' independent learning is an essential component of the educational process in higher education. This is particularly important when studying complex scientific disciplines such as "Human and Animal Physiology," where it is necessary to foster students' abilities to study independently, analyze information, and conduct scientific inquiry. Independent learning enables students to deepen their theoretical knowledge, master educational materials on their own, and search for new information.

An important aspect of developing students' independent learning activities is forming their skills in working with various scientific sources. By using research articles, monographs, electronic resources, and modern academic literature, students can broaden their knowledge base. This process promotes the development of critical thinking, scientific analysis, and the ability to synthesize acquired information.

The effective organization of independent learning also involves assigning individual or group tasks. For example, preparing essays, delivering academic presentations, or conducting small-scale research on specific physiological processes encourages students to engage in independent inquiry. Such activities help students learn to justify their opinions, work with scientific evidence, and present research results effectively.

In addition, the use of digital learning resources plays a significant role in supporting independent education. Electronic libraries, scientific databases, online learning platforms, and video lectures provide students with opportunities for self-directed learning. This not only increases their engagement in the learning process but also facilitates deeper understanding of the subject matter.

The teacher's role as a facilitator and advisor is equally important in developing students' independent learning. Instructors should guide students in research methods, recommend relevant academic sources,

and monitor their independent work. This supportive approach motivates students to continuously improve their knowledge and research skills on their own.

4. Introduction of a Competency-Based Approach.

One of the important directions for the effective organization of the educational process in higher education is the implementation of a competency-based approach. This approach is aimed not only at mastering theoretical knowledge but also at developing practical skills and professional qualifications. In teaching the course “Human and Animal Physiology,” the competency-based approach plays a significant role in preparing students for their future professional activities.

Within this approach, the educational process includes the following aspects:

1. Integration of theoretical knowledge with practical skills.

Students are provided with opportunities not only to study theoretical concepts but also to apply them through laboratory experiments, practical tasks, and simulations. For instance, studying blood circulation or the respiratory system through laboratory activities enables students to apply theoretical knowledge in practice and develop professional skills.

2. Development of decision-making skills in problem-based situations.

A competency-based approach promotes logical thinking, analytical abilities, and problem-solving skills. By examining physiological processes through real-life examples and case-based tasks, students learn to independently address complex scientific problems.

3. Encouraging active student participation. This approach motivates students to engage actively in the learning process. Group work, project-based tasks, presentations, and interactive sessions help students consolidate their knowledge while also developing teamwork and communication skills.

4. Competency-based assessment system. Student evaluation is not limited to test results but also includes the assessment of practical skills, the ability to conduct experiments, and scientific analytical competence. Such an assessment system contributes to the formation of students’ professional competencies.

Furthermore, the competency-based approach supports the development of students’ research abilities and independent learning skills, which are essential for their future professional careers. When integrated with interactive teaching methods, the implementation of a competency-based approach significantly enhances the effectiveness of teaching physiology.

Results and Discussion. In our view, the introduction of digital learning technologies creates new opportunities for teaching physiology. The effective use of electronic textbooks, virtual laboratories, multimedia tools, and digital learning platforms can enhance students’ academic performance, develop their scientific thinking, and improve the overall organization of the educational process. Therefore, the widespread implementation of digital technologies in teaching physiology in higher education institutions should be considered one of the key priorities.

Improving practical training is also an important factor in increasing the effectiveness of teaching the course “Human and Animal Physiology.” Expanding the number of laboratory experiments, using modern equipment, and ensuring students’ active participation can significantly improve the quality of the learning process.

The development of students’ independent learning contributes greatly to enhancing the effectiveness of physiology education. Through independent research activities, students not only strengthen their theoretical knowledge but also develop skills in scientific investigation, problem analysis, and independent decision-making. For this reason, supporting and effectively organizing students’ independent learning in higher education institutions is an important pedagogical task.

The implementation of a competency-based approach is one of the most effective ways to improve the quality of teaching physiology, prepare students professionally, and develop their independent learning abilities. The integration of modern pedagogical technologies into the educational process increases students’ learning activity. By using interactive methods, students become more motivated to acquire knowledge independently. Moreover, increasing the number of practical classes and laboratory experiments

in physiology helps to develop students' scientific thinking.

Conclusion. Modernizing the methodology of teaching the course "Human and Animal Physiology" in higher education institutions is one of the key factors in improving educational effectiveness. The use of interactive methods, modern pedagogical technologies, and digital learning tools contributes to the development of students' knowledge and practical skills.

Therefore, applying innovative approaches in teaching physiology, integrating theoretical knowledge with practical training, and fostering students' independent learning activities are of great importance for enhancing the quality of education.

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